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COMMITTEE ON THE PEACEFUL
USES OF OUTER SPACE
Scientific and Technical Subcommittee
Thirty-fourth session
Vienna, 17-28 February 1997

# DRAFT REPORT OF THE SCIENTIFIC AND TECHNICAL SUBCOMMITTEE ON THE WORK OF ITS THIRTY-FOURTH SESSION

## E. Regional and interregional cooperation

1. The Subcommittee noted that the General Assembly, in its resolution 51/123, emphasized the importance of implementing fully the recommendations of UNISPACE 82 regarding the promotion of the establishment and strengthening of regional mechanisms of cooperation through the United Nations system. The Subcommittee noted with satisfaction that, in carrying out various activities in the implementation of the recommendations of UNISPACE 82, the Secretariat had sought to strengthen those mechanisms.

2. The Subcommittee noted with appreciation the efforts undertaken by the United Nations Programme on Space Applications, in accordance with General Assembly resolution 45/72, in leading an international effort to establish regional centres for space science and technology education in existing national or regional educational institutions in developing countries. The Subcommittee also noted that, once established, each centre could expand and become part of a network that could cover specific programme elements in established institutions related to space science and technology in each region.

3. The Subcommittee recalled that the General Assembly, in its resolution 50/27, had endorsed the recommendation of the Committee that the centres be established on the basis of affiliation to the United Nations as early as possible and that such affiliation would provide the centres with the necessary recognition and would strengthen the possibilities of attracting donors and of establishing academic relationships with national and international space-related institutions.

4. The Subcommittee recalled that the General Assembly, in its resolution 51/123, had noted with satisfaction that the regional Centre for Space Science and Technology Education in Asia and the Pacific had begun its first education programme in April 1996 and that significant progress had also been achieved in establishing regional centres for space science and technology education in the other regions covered by the regional commissions.

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5. The Subcommittee noted with regard to the regional Centre for Space Science and Technology Education in Asia and the Pacific, inaugurated in India in November 1995, that participation in the governing board of the Centre and in its activities was open to Member States in the region and that, in due course and upon approval by its governing board, the Centre would grow into a network of nodes enabling it to fully utilize the resources and potential of the region. The Subcommittee noted with satisfaction that the first nine-month education programme of the Centre had focused on remote sensing and the Geographic Information System (GIS) and had been completed and that the second programme on satellite communications had started in January 1997.

6. Some delegations expressed the view that the Office for Outer Space Affairs should undertake further consultations among States in the region in order to resolve the outstanding differences in respect of the Centre in Asia and the Pacific.

7. The Subcommittee noted with satisfaction that Brazil and Mexico had announced their intention to sign the agreement establishing the regional Centre for Space Science and Technology Education in Latin America and the Caribbean in March 1997. The Subcommittee also noted with satisfaction the statement of the delegation of Bolivia, on behalf of the Latin American and Caribbean States, supporting the future establishment and operation of that Centre for the benefit of the States in the region and expressing the profound interest of those States in participating in the activities of the Centre.

8. Regarding the centres in Africa, the Subcommittee noted that Morocco (for the French-speaking African countries) and Nigeria (for the English-speaking African countries) were developing cooperation agreements that would be entered into by the States concerned later in 1997.

9. The Subcommittee noted that discussions were in progress with Jordan, Saudi Arabia and the Syrian Arab Republic on the establishment of a regional centre in western Asia.

10. The Subcommittee noted that discussions between Bulgaria, Greece, Poland, Romania, Slovakia and Turkey were in progress on the establishment of a network of space science and technology education and research institutions for central eastern and south-eastern European countries and that the activities of the network would be in harmony with the relevant work of existing institutions in Europe and would be open to international cooperation. The Subcommittee noted that a meeting of experts had been held at Vienna from 17 to 18 October 1996 on the establishment of the network and that the experts had resumed their deliberations from 13 to 14 February 1997. The Subcommittee further noted that at the resumed session, the experts had agreed to work with the Office for Outer Space Affairs to undertake a study on the technical requirements, design, operation mechanism and funding of the Network.

11. The Subcommittee noted that the satellite-based COPINE project would offer an excellent opportunity for the exchange of information needed to promote progress in health care, agriculture, education, science and technology, and the management and survey of natural resources and the environment in Africa. The Subcommittee noted that such cooperation would provide long-term benefits to the participating African countries and would contribute to economic growth in the region.

12. The Subcommittee noted that the 4th Asia-Pacific Conference on Multilateral Cooperation in Space Technology and Applications would be hosted by the United Arab Emirates in December 1997 and that it would provide opportunities for technologists, experts and decision makers to discuss the framework and mechanisms to institutionalize regional cooperation in the development and applications of space technology.

13. The Subcommittee noted the announcement of the Latin American Seminar on Aerospace Medicine, to be held under the auspices of the United Nations at Santiago, Chile, from 5 to 6 June 1997, with the objective of disseminating the analyses of progress of human activities in space and promoting regional cooperation in that specialized discipline.

14. The Subcommittee took note of the proposal of Ukraine to host an International Congress on the theme "Philosophy of space activities at the threshold of a new millennium" at Kiev from 12 to 17 May 1998. Special attention would be paid to the questions of space activities and recent global problems of humankind; global information systems and space telecommunications technology; space science; and legal issues related to space activities.

15. The Subcommittee noted the contributions made by specialized agencies and other international organizations towards the promotion of international cooperation in space activities: FAO was continuing its activities relating to the remote sensing of renewable natural resources and environmental monitoring, including training courses and the support of development projects; the World Meteorological Organization (WMO) was continuing international cooperative programmes using space technology, including the World Weather Watch and the Tropical Cyclone Programme; the United Nations Educational, Scientific and Cultural Organization (UNESCO) was promoting applications of space technology for archaeology and strengthening international and interdisciplinary cooperation between archaeological projects; UNIDO was continuing its work on spin-off benefits of space technology; INTELSAT was further developing its system for international satellite communications and broadcasting, including its programmes for training and technical assistance; ESA was continuing its programme of international cooperative space activities, including training programmes for the benefit of developing countries, support of the activities of the United Nations Programme on Space Applications and technical assistance projects; and the International Civil Aviation Organization (ICAO) was continuing its work towards implementation of communications, navigation and surveillance/air traffic management (CNS/ATM) systems.

16. The Subcommittee emphasized the importance of regional and international cooperation in making the benefits of space technology available to all countries by such cooperative activities as sharing payloads, disseminating information on spin-off benefits, ensuring compatibility of space systems and providing access to launch capabilities at reasonable cost.

## III. MATTERS RELATING TO REMOTE SENSING OF THE EARTH BY SATELLITES INCLUDING, *INTER ALIA*, APPLICATIONS FOR DEVELOPING COUNTRIES

17. In accordance with General Assembly resolution 51/123, paragraph 18 (a), the Subcommittee continued its consideration of the item relating to remote sensing of the Earth.

18. In the course of the debate, delegations reviewed national and cooperative programmes in remote sensing. Examples were given of national programmes in developing and developed countries and of international programmes based on bilateral, regional and international cooperation, including programmes of technical cooperation between developing countries. Delegations of countries with advanced capabilities in the field, including some developing countries, described programmes to provide assistance to developing countries.

19. The Subcommittee took note of the continuing programmes of Argentina, Australia, Austria, Brazil, Canada, China, Ecuador, France, Hungary, Germany, India, Indonesia, Japan, Lebanon, Morocco, Romania, Russian Federation, Ukraine, United States, as well as ESA, for the development and use of information generated from remote sensing satellites. The Subcommittee noted that the European Remote Sensing (ERS-2) satellite, the RADARSAT satellite of Canada, the ADEOS-1 satellite of Japan, and the IRS-P3 satellite of India were providing

valuable microwave data to complement the data from ERS-1 and from the Japanese Earth Resources Satellite (JERS-1), as well as the visible and infrared data from satellites of IRS-1C, Landsat, Resurs, SPOT, Indian Remote Sensing (IRS) and Marine Observation Satellite (MOS) series. The Subcommittee also noted the remote sensing systems being developed for future launch, including SAC-C of Argentina, Fengyan-2 and Ziyuan-1 of China, RADARSAT-II of Canada, CBERS of China and Brazil, Jason-1 of France, IRS-1D of India, ADEOS 2 and the Advanced Land Observing Satellite (ALOS) of Japan and the Tropical Rainfall Measuring Mission (TRMM) of Japan and the United States, and various systems of the Russian Federation. It also took note of the joint German-Russian long-term Modular Optoelectronic Multispectral Stereo-Scanner (MOMS) mission on MIR, the Applications Development Research Opportunity (ADRO) programme of NASA and the Canadian Space Agency, as well as the activities of France in the area of combating desertification using Satellite pour l'observation de la Terre (SPOT) data in cooperation with the countries concerned. It also took note of the activities of ISPRS in promoting international cooperation in remote sensing and image processing. The Subcommittee heard a scientific and technical presentation on the remote sensing activities of Morocco in the management of water resources, as described in paragraph __ of the present report.

20. The Subcommittee reiterated its view that remote sensing activities should take into account the need to provide appropriate and non-discriminatory assistance to meet the needs of developing countries.

21. The Subcommittee emphasized the importance of making remote sensing data and analysed information openly available to all countries at reasonable cost and in a timely manner. The Subcommittee also recognized the example of international cooperation in WMO in the exchange of meteorological data as provided for in resolution 11.4/1 adopted at the XIIth WMO Congress on 21 June 1995. Some delegations called attention to the international cooperation given by some members through traditionally free and open provisions of meteorological satellite data and encouraged those countries to continue that practice.

22. The Subcommittee considered that international cooperation in the use of remote sensing satellites should be encouraged, both through coordination of the operation of ground stations and through regular meetings between satellite operators and users. It noted the importance of compatibility and complementarity of existing and future remote sensing systems, as well as the need for continuity in the acquisition of data. The Subcommittee also noted the importance, particularly for developing countries, of sharing experiences and technologies, of cooperation through international and regional remote sensing centres and of joint work on collaborative projects. The Subcommittee further noted the value of remote sensing systems for environmental monitoring and, in that context, stressed the need for the international community to fully utilize remote sensing data in an effort to fully implement the recommendations contained in Agenda 21,[1] adopted by the United Nations Conference on Environment and Development, held at Rio de Janeiro from 3 to 14 June 1992.

23. The Subcommittee noted with satisfaction the prototype Information Locator Service (ILS), funded by DARA and currently in the design and implementation phase. The Subcommittee also noted that the system was being designed to assist users in developing countries in locating and accessing sources of information about Earth observation data, projects and services to meet their needs. It further noted that the system technology was based on a special World Wide Web server that would be installed at various strategic nodes and would be equipped with a feature to enable users in developing countries to include and maintain their own data and to design the content to suit their own specific needs.

24. The Subcommittee took note of the programmes of Argentina, Bulgaria, Mexico, Morocco, Pakistan, Romania and Spain in the area of small satellites and microsatellites. The Subcommittee recalled that at its thirty-third session, it had recommended that more of the activities of the United Nations Programme on Space Applications should be devoted to that theme (A/AC.105/637 and Corr.1, para. 182). Some delegations expressed the view that the subject of small satellites should be included in the agenda of the Subcommittee. Some also expressed the view that the subject should be included as a possible agenda item for the UNISPACE III Conference.

25. Recalling General Assembly resolution 41/65 by which the Assembly adopted the Principles Relating to Remote Sensing of the Earth from Outer Space, the Subcommittee recommended that at its thirty-fifth session it should continue its discussion on remote sensing activities conducted in accordance with the Principles during its consideration of the agenda item concerning remote sensing.

26. The Subcommittee recommended that the item should be retained on its agenda as a priority item for its thirty-fifth session.

## IV. USE OF NUCLEAR POWER SOURCES IN OUTER SPACE

27. In accordance with General Assembly resolution 51/123, paragraph 18 (a), the Subcommittee continued its consideration, on a priority basis, of the item relating to the use of nuclear power sources in outer space.

28. The Subcommittee recalled that the General Assembly had adopted the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, contained in its resolution 47/68. The Subcommittee noted that the Committee[2] at its thirty-ninth session, had recalled the agreement reached at its thirty-eighth session that the Principles should remain in their current form until amended and that, before amendment, proper consideration should be given to the aims and objectives of any proposed revision.[3] The Subcommittee agreed that, at the present time, revision of the Principles was not warranted. The Subcommittee also agreed that, until a firm scientific and technical consensus had been reached on the revision of the Principles, it would be inappropriate to pass the topic to the Legal Subcommittee.

29. The Scientific and Technical Subcommittee also recalled that it had agreed at previous sessions that regular discussions on that issue should continue at future sessions and that it should continue to receive the widest input on matters affecting the use of nuclear power sources in outer space and any contribution related to improving the scope and application of the Principles.

30. The Subcommittee noted the statement made by the representative of IAEA stating that the Principles should be reviewed in view of the most recent International Commission on Radiological Protection (ICRP) recommendations on radiation safety incorporated into the IAEA International Basic Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, published by IAEA as Safety Series No. 115. The IAEA noted in particular that the principles relating to notification of re-entry of space objects with nuclear power sources on board, as well as those relating to subsequent assistance to States, should be revised in view of the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. The Subcommittee noted that Safety Series Practice Document No. 119, entitled *"Emergency Planning and Preparedness for Re-entry of a Nuclear Powered Satellite"*, had been published by IAEA in its final form in 1996.

31. Mindful of the differences in the safety principles applied for space and the safety standards for terrestrial systems, the Subcommittee agreed that the study of those developments, arising from the latest ICRP recommendations, should be continued.

32. The Subcommittee agreed, at its 494th meeting, on 25 February 1997, to reconvene its Working Group on the Use of Nuclear Power Sources in Outer Space, under the chairmanship of D. Rex (Germany). The Working Group met from 25 to __ February 1997. At a meeting held on __ February 1997, the Working Group adopted its report.

33. At its __ meeting, on __ February 1997, the Subcommittee adopted the report of the Working Group, which is contained in annex III to the present report.

34. The Subcommittee noted that in response to its recommendation, the General Assembly, in resolution 51/123, paragraph 22, had invited Member States to report to the Secretary-General on a regular basis with regard to national and international research concerning the safety of space objects with nuclear power sources on board. The Subcommittee also noted that the General Assembly, in paragraph 32 of the same resolution, had considered that, to the extent possible, information on the problem of collisions of space objects, including those with nuclear power sources, with space debris should be provided to the Subcommittee, in order to allow it to follow that area more closely. The Subcommittee noted that information had been submitted in response to those requests by Brunei Darussalam, Bulgaria, Canada, Germany, Hungary, Japan, Portugal, Republic of Korea, Russian Federation, Sweden and United Kingdom (A/AC.105/659 and Add. 1 and 2).

35. The Subcommittee heard scientific and technical presentations on the topic of nuclear power sources by the Russian Federation, as described in paragraph __ of the present report.

36. The Subcommittee took note of the working paper submitted by the Russian Federation on the use of nuclear power sources in outer space (A/AC.105/C.1/L.208) and by the United Kingdom on progress with revision of the Principles (A/AC.105/C.1/L.210).

37. The Subcommittee agreed that Member States should continue to be invited to report to the Secretary-General on a regular basis with regard to national and international research concerning the safety of space objects with nuclear power sources. The Subcommittee also agreed that further studies should be conducted on the issue of the collision of orbiting space objects with nuclear power sources on board with space debris and that it should be kept informed of the results of such studies.

38. While agreeing that a revision of the Principles was not necessary at the present time, the Subcommittee stressed that it was important that States making use of nuclear power sources in space should conduct their activities in full accordance to the Principles.

39. Some delegations expressed the view that space objects with nuclear power sources on board could be used for limited purposes such as inter-planetary space missions where conventional solar power might not provide sufficient power. One delegation expressed the view that, since most accidents occurred in the ascending, descending and pre-orbital stages, it was important to follow the Principles and to continue in-depth studies on operational technology and safety norms. That delegation also expressed the view that the launch vehicles used for space objects with nuclear power sources on board should be designed to ensure successful launches and to avoid the destruction of the nuclear power source in the event of an accident through the reinforced structure and the design of the nuclear power source on board.

40. One delegation expressed the view that in developing future space objects equipped with nuclear power sources, measures to ensure safety (radiation, nuclear, ecological) would be aimed at minimizing the effects of ionizing emissions and radioactive and toxic materials on the population and the environment, including outer space. That delegation also expressed the view that the safety of those spacecraft at all stages of their operation and in the event of foreseeable accidents would be ensured by safety systems and nuclear power source structural elements designed to meet safety requirements and by special comprehensive administrative and technical measures to prevent accidents and eliminate the effects of accidents.

41. Some delegations expressed the view that in due time the Principles might be updated by supplementary principles. Some delegations also expressed the view that in considering possible revisions of the Principles, reference should be made to the IAEA Safety Series publication on emergency planning and preparedness for re-entry of a nuclear powered satellite.

42. Other delegations expressed the view that revising or supplementing the Principles was not necessary at the present time and that the Principles should remain in their current form until a solid technical foundation on the subject could be established.

43. The view was also expressed that, in the light of submissions made to the Subcommittee and its Working Group on the Use of Nuclear Power Sources in Outer Space, and particularly the inconsistencies identified by IAEA, work on preparing for the revision of the Principles should be initiated.

44. The Subcommittee recommended that the item be retained on its agenda for the thirty-fifth session and that the time allocated to the topic in the Subcommittee and the Working Group should be adjusted as appropriate.

## V. SPACE DEBRIS

### A. General matters

45. In accordance with General Assembly resolution 51/123, paragraph 18 (a), the Subcommittee continued its consideration, on a priority basis, of the agenda item on space debris.

46. The Subcommittee agreed that consideration of space debris was important and that international cooperation was needed to expand appropriate and affordable strategies to minimize the potential impact of space debris on future space missions.

47. The Subcommittee noted with appreciation the report by the Secretariat (A/AC.105/663) prepared in response to its request to compile on an annual basis the information on various steps taken by space agencies for reducing the growth or damage potential of space debris and to encourage common acceptance of those steps by the international community, on a voluntary basis (A/AC.105/605, para. 80).

48. The Subcommittee took note of the following programmes of Member States and organizations on the acquisition and understanding of data on the characteristics of the space debris environment and on measuring, modelling and mitigating the orbital debris environment. The Subcommittee noted the following modelling programmes: the fast analytical model CHAINEE and a new semi-deterministic modelling tool, the Long Term Utility for Collision Analysis (LUCA) of Germany; studies on space debris modelling in China, India, Italy and Japan; the Integrated Debris Evolution Suite (IDES) of the United Kingdom; the complex BUMPER, CHAIN, EVOLVE and ORDEM 96 models of the United States; analytical and numerical models developed by the Russian Federation; and the Space Debris Reference Model (MASTER) of ESA. The Subcommittee also noted the following measuring and mitigation programmes: the Material Exposure in Low Earth Orbit (MELEO) experiment and the Advanced Composite Material Exposure Experiment (ACOMEX) of Canada; the Tracking and Image Radar Station (TIRA) of Germany, the Long Duration Exposure Facility (LDEF), the Haystack Orbital Debris Radar, the Orbital Debris Radar Calibration Spheres (ODERACS-1 and 2), the Charged Couple Device (CCD) Debris Telescope and the Liquid Metal Mirror Telescope (LMMT) of the United States; the Space Flyer Unit (SFU), the Communication Research Laboratory (CRL) telescope system and Middle and Upper Atmosphere (MU) radar system of Japan; studies on space debris and practical mitigation techniques in China and France; and the various monitoring facilities established by the Russian Federation.

49. The Subcommittee took particular note of the reports on the first confirmed collision of two catalogued objects in orbit. The Subcommittee noted that the collision had occurred on 24 July 1996 and, although it was not directly observed, sufficient evidence had been obtained from the orbit and attitude behaviour of the two objects involved. The Subcommittee further noted that the event was significant for the validation of statistical models predicting the probability of similar collisions in the future.

50. The Subcommittee agreed that Member States should pay more attention to the problem of collisions of space objects, including those with nuclear power sources on board, with space debris and other aspects of space debris. It noted that the General Assembly, in its resolution 51/123, had called for the continuation of national research on that question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris. The Subcommittee recalled the request of the Assembly that information on those issues should be submitted to the Subcommittee, and took note of the replies from Member States (A/AC.105/659 and Add. 1 and 2) that had been submitted to it in accordance with that request. The Subcommittee further agreed that national research on space debris should continue and that Member States and international organizations should make available to all interested parties the results of that research, including information on practices adopted that had proved effective in minimizing the creation of space debris.

51. The Subcommittee heard scientific and technical presentations on the subject of space debris by France, Germany, Japan, United Kingdom, United States, ESA and IADC as mentioned in paragraph __ of the present report.

52. The Subcommittee noted that cooperation had continued through the Inter-Agency Orbital Debris Coordination Committee (IADC), with the participation of Japan, NASA, ESA, the Russian Space Agency , the Chinese National Space Agency and, since 1996, the British National Space Centre, the Centre national d'études Spaciales (CNES) and ISRO, to enable its members to exchange information on space debris activities facilitate opportunities for cooperation in space debris research, review the progress of ongoing activities and identify debris mitigation options. The Subcommittee also noted that the German Space Agency (DARA) had applied for membership in IADC in 1997.

53. The Subcommittee noted with satisfaction that, following its invitation, representatives of IADC had made a technical presentation on the subject of space debris modelling and risk assessment as mentioned in paragraph __ of the present report. The Subcommittee agreed that IADC should be invited to make a technical presentation on space debris mitigation practices at its thirty-fifth session.

54. The Subcommittee recalled that, in order to advance in its consideration of its agenda item on space debris, it had adopted, at its thirty-second session, a multi-year plan for consideration of space debris. The Subcommittee also recalled that at each session it should review the current operational debris mitigation practices and consider future mitigation methods with regard to cost-efficiency (A/AC.105/637 and Corr.1, para. 92).

55. The Subcommittee noted that at its thirty-third session, in accordance with the multi-year plan, it had focused its attention on measurements of space debris, understanding of data and effects of that environment on space systems, as reflected in its technical report for 1996 (A/AC.105/637 and Corr.1, paras. 94-138).

56. The Subcommittee took note of the technical changes and amendments to its technical report for 1996 (A/AC.105/C.1/L.214). Those changes would be incorporated in the full report of the Subcommittee on its multi-year work plan, which would be presented to the Subcommittee at its thirty-sixth session, in 1999.

57. At the current session, the Subcommittee focused its attention on modelling of the space debris environment and risk assessment.

**B. Technical report of the Subcommittee for 1997**

[Paragraphs to be added]

## C. General views

58. The view was expressed that there was a need to develop a common database for space debris that could serve as a clearing house of information for the international community for research and further advancement of knowledge in that field.

59. Some delegations were of the view that adequate time should be allocated to the thirty-sixth session of the Scientific and Technical Subcommittee, in 1999, for the completion of the technical report on space debris.

60. Some delegations were of the view that the Legal Subcommittee should be informed of the discussions in the Scientific and Technical Subcommittee under the agenda item on space debris. The view was expressed that a "launcher pays" principle, similar to the "polluter pays" principle in global environmental issues, should be adopted as one of the fundamental elements of a legal regime aimed at reducing space debris and that, when such a principle would be adopted and applied, the launcher should pay a fee that could be used for joint research activities to reduce space debris.

61. Other delegations expressed the view that it would not be appropriate to discuss the issue of space debris in the Legal Subcommittee or to develop recommendations in the Scientific and Technical Subcommittee to underpin new legal norms for orbital debris in view of the many technical issues that still needed to be discussed by the Scientific and Technical Subcommittee in order to establish an adequate base of knowledge on the topic.

62. The view was expressed that, in the technical report on space debris, section 3.1.3, entitled "De-orbiting and re-orbiting of space objects", could be renamed "De-orbiting and re-orbiting of manoeuvrable space objects" and that a new section 3.1.4 could be inserted, entitled, "De-orbiting and re-orbiting of space objects without manoeuvring capability". In the view of that delegation, the Subcommittee could encourage the scientific community by manifesting its interest in the above problem through calls for more national research on non-manoeuvrable debris.

63. The view was expressed that the Subcommittee should establish a working group to discuss space debris and that it was important for the Subcommittee to have a common understanding of the term "space debris". The view was also expressed that the definition proposed at the thirty-second session of the Subcommittee (A/AC.105/605, para. 95) could be modified to include the words "whether their owners can be identified or not" after the words "including their fragments and parts" so that the definition would read as follows: "space debris are all man-made objects, including their fragments and parts, whether their owners can be identified or not, in Earth orbit or re-entering the dense layers of the atmosphere that are non-functional with no reasonable expectation of their being able to assume or resume their intended functions or any other functions for which they are or can be authorized". The view was expressed that further specification in the definition of space debris would deserve expert consideration at the thirty-fifth session of the Subcommittee.

64. The Subcommittee recommended that the item be retained on its agenda as a priority item for its next session.

## Notes

1. *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8 and corrigenda), vol. I: *Resolutions Adopted by the Conference*, resolution 1, annex II.

2. *Official Records of the General Assembly, Fifty-first Session, Supplement No. 20* (A/51/20), para. 75.

3. Ibid., *Fifteenth Session, Supplement No. 20* (A/50/20), para. 62.